Introduction to Statistical Data Analysis

Exercise

We are interested in a process which manufactures cylindrical pipes. We have sampled n = 5 pipes, every hour, during 24 hours. The 24 × 5 diameters (in mm) of these pipes are in file 24heures.dat.

1. Plot the data

```
-->x=read("24heures.dat",24,5)
-->u=matrix(ones(5,1)*(1:24),24*5,1);
-->v=matrix(x',24*5,1);
-->figure; clf
-->plot2d(u,v,-9,"011"," ",[0,4.6,25,5.5],[1,25,1,9]);
```

2. Test the normality of the process

```
-->sort=gsort;
-->figure;
-->qplot(x,"normal")
-->andersondarling(x)
-->tstsku(x)
```

3. Do the same for the machine.

4. Compute $\bar{X}, \tilde{X}, S_M, R_M, S_P, R_P$

5. Deduce μ, σ_M and σ_P .

Toolbox CASCI: Probability and Statistics functions
by P. Castagliola, Université de Nantes

Functions: toolbox CASCI:
qplot – quantile plot
andersondarling – Anderson-Darling's normality tes t
tstsku – normal skewness and kurtosis test
krnge – range coefficients KR (n)
kstandev – standard-deviation coefficients KS (n, r)